Ivanov, R. N.

AUTHORS: Gorshkov, V.K., Ivanov, R.N., Kukavadze, G.M., Reformatskiy, I.A. 89-7-2/32

TITLE: The Yield of Fission Products of U^{235} Within the Domain of Rare Earths (Vykhod produktov deleniya U^{235} v redkozemel'noy oblasti)

PERIODICAL: Atomnaya Energiya, 1957, Vol. 3, Nr 7, pp. 11-14 (USSR)

ABSTRACT: The present paper describes the measuring of these yields by means of the integral mass-spectrographic method, with the help of which the relative share (in %) of several elements contained in the sample can be determined simultaneously during the experiment. This method permits the mass-spectroscopical measuring of the yields on La^{139}, Pr^{141}, Pm^{147} and Pm^{149}. Working out this method and measuring took place on a mass spectrograph with a resolving capacity of 1 : 800. First, the production of the samples is discussed. The uranium preparation enriched somewhat with U^{235} was here irradiated with thermal neutrons in a reactor. The final results of these mass-spectrographic measurings are shown in a table and are compared with some data given in publications.
Lanthanum, praeseodymium, promethium, samarium: The increased yield of La^{139} can hardly be explained by means of the hitherto existing

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theoretical investigations concerning the course of the curve of the yields. The peak "composed" from Pm^{147} and Sm^{147} was separated on the basis of the difference between the sublimation temperatures of samarium and promethium. According to various details given concerning the above mentioned elements the authors compute the cross section of the absorption of neutrons for Pm^{147} and find:

$\sigma_{147} = 90 \pm 20$ barn. $\sigma^{Sm}_{147} = 1000 \pm$ barn.

Neodym: The yields of: Nd^{143} and Nd^{144} given here are somewhat lower than those given in publications. Cerium: Two isotopes are contained mainly in the sample investigated here, namely Ce^{140} and Ce^{142} with the ratio of the masses $M_{140}/M_{142} = 1{,}082 \pm 0{,}029$. The lack of noticeable amounts of Ce^{144} is explained by their decay in Nd^{144}. Samarium: For the lower limit of the absorption cross section of Sm^{149} for thermal neutrons the value 58 000 $\pm$ 9000 barn is found. The following composition of isotopes for samarium was found by the authors (in %):

The Yield of Fission Products of U^{235} Within the Domain of Rare Earths

89-7-2/32

Sm^{146}: 40 ± 3; Sm^{148}: 15 ± 2; Sm^{150}: $38 + 3$; Sm^{152}: 7 ± 2. There are 1 figure, 3 tables, and 6 references, 3 of which are Slavic.

SUBMITTED: January 12, 1957

AVAILABLE: Library of Congress

Card 3/3

1. Uranium isotopes (Radioactive)-Fission 2. Rare earths-Mass spectra 3. Lanthanum isotopes (Radioactive)-Determination 4. Praeseodymium isotopes (Radioactive)-Determination 5. Promethium isotopes (Radioactive)-Determination 6. Samarium isotopes (Radioactive)-Determination 7. Neodym isotopes (Radioactive)-Determination

89-12-11/29

AUTHORS: Ivanov, R. N., Gorshkov, V. K., Anikina, M. P., ~~Kukavadze, G.~~ M., Ershler, B. V.

TITLE: Fission Yields of Several Heavy Fission Products of U^{233} (Vykhody nekotorykh tyazhelykh oskolkov pri delenii U^{233})

PERIODICAL: Atomnaya Energiya, 1957, Vol. 3, Nr 12, pp. 546-547 (USSR)

ABSTRACT: The absolute fission yields were determined by means of the isotope dilution method (1) and of the mass spectrographically obtained integral concentrations (2). The sample of U^{233} was irradiated for two months in a reactor.
The following yields in % were measured:

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89-12-11/29

Fission Yields of Several Heavy Fission Products of U^{235}

	Absolute Yield according to	
Isotope	Method 1	Method 2
Cs^{133}	5,2 ± 0,3	5,50 ± 0,13
Cs^{137}	5,8 ± 0,3	6,16 ± 0,14
Ce^{140}	5,45± 0,50	6,16 ± 0,24
Ce^{142}	5,5 ± 0,5	6,06 ± 0,24
Nd^{143}	5,0 ± 0,3	5,19 ± 0,17
Nd^{144}	3,8 ± 0,4	3,84 ± 0,15
Nd^{145}	2,82± 0,25	2,88 ± 0,08
Nd^{146}	2,20± 0,15	2,24 ± 0,07
Nd^{148}	1,03± 0,10	1,07 ± 0,04
Nd^{150}	0,51± 0,08	0,49 ± 0,02
Sm^{149}	0,66± 0.13	0,70 ± 0,03
$Sm^{151+152}$	0,60± 0,14	-- --
Sm^{151}	-- --	0,54 ± 0,03

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Fission Yields of Several Heavy Fission Products of U^{233} 89-12-11/29

The Xe^{135} -absorption coefficient was obtermined at $(3,2 \pm 1,0) \cdot 10^{6}$ b.
(There are 1 table, 1 figure and 8 references, 5 of which are Slavic).

SUBMITTED: May 20, 1957

AVAILABLE: Library of Congress

Card 3/3

IVANOV, R. N.

MURIN, A. N., ERSHLER, B. V., KUKAWADZE, G. M., ANIKHINA, M. P., GORSHKOV, V. K., IVANOV, R. N., KRIZANSKIY, L. M. and REFORMATSKIY, I. A.

"Mass-Spectrometric Study of U^{233}, U^{235} and Pu^{239} Fission Products."

paper to be presented at 2nd UN Intl. Conf. on the peaceful uses of Atomic Energy, Geneva, 1 - 13 Sep 58.

IVANOV, R. N.

AUTHORS: Anikina, M. P., Ivanov, R. N., Kukavadze, G. M., Ershler, B. V., 89-2-22/35

TITLE: The Half-Life of Sr^{90} and Its Fission Yield from U^{233} (Period poluraspada Sr^{90} i vykhod ego pri delenii U^{233}).

PERIODICAL: Atomnaya Energiya, 1958, Nr 2, pp. 198-198 (USSR)

ABSTRACT: According to the usual method the half-life of Sr^{90} was determined to be 29,3 ± 1,6 a.
The yields of Sr^{90} and Sr^{88} in the $U^{233}(n,f)$ reaction were determined to be 5,3 ± o,3 % for Sr^{88} and
5,8 ± o,4 % for Sr^{90}.
The yield for Sr^{90} given in reference 7 must be calculated a new, as the half-life period of 19,9 a was still used there. When the newly determined half-life period is used, the yield in this case amounts to 6,3 ± o,3 %. There are 1 table and 7 references, 4 of which are Slavic.

SUBMITTED: September 18, 1957

AVAILABLE: Library of Congress

Card 1/1

1. Half life-Measurement 2. Strontium 90-Half life-Measurement

IVANOV, R.N.

7

Corrosion of alloy steels under the conditions of methanol synthesis. R. N. Ivanov and L. I. Kozlov. *Khim. Mashinostroenie* 5, No. 6, 30 (1936). *Chimie & industrie* 38, 923.—Corrosion of steel during the synthesis of MeOH results mainly in the production of Fe carbonyl. The metals alloyed with the steel can reduce corrosion, but not suppress it completely. The most resistant steels are those with high Cr content (13-15%); their corrosion is practically nil up to 100° and above 300°. Cr-V steel, on the other hand, is unsuitable. To secure practically abs. resistance, the steel should be covered with a protective lining such as a surface layer of a high-Cr Fe-Cr alloy. A. P.-C.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

IVANOV, R.N.

Crystalline form of calcium sulfate in superphosphate. Dokl. AN Uz. SSR no.8:37-40 '57. (MIRA 11:5)

1. Institut khimii AN UzSSR. Predstavleno akad. AN UzSSR M.N. Nabiyevym.

(Calcium phosphate)

IVANOV, K. N.

The ammoniation process for the superphosphate (production) from the Kara-Tau phosphorites. K. N. Ivanov. *Khim. Prom.* 1957, 79-82.—The Kara-Tau phosphorites in Central Asia have become very important in Russia in connection with the drive to reach a phosphate fertilizer production of 10.0 X 10[6] tons in 1960. The compn. of the phosphorites varies greatly; they contain dolomitic limestones, and the superphosphate prepd. from them by the methods in use for apatite would contain the very hygroscopic $Mg(H_2PO_4)_2$, which causes lumping and a plastic mass formation in the product. Moreover, the superphosphate produced contains up to 6.6% free H_3PO_4, which adds to its hygroscopicity. The ammoniation of the superphosphate was first tried on a pilot plant in 1953 and in a semicom. plant in 1953-4, and has now been successfully adopted in the industry. Gaseous NH_3 reacts with the free H_3PO_4 in the superphosphate with the formation of $NH_4H_2PO_4$, which then reacts with the $Mg(H_2PO_4)_2$ and $Ca(H_2PO_4)_2$ present, converting them to the water-sol. $MgNH_4PO_4$ and the citrate-sol. $CaHPO_4.2H_2O$ and $MgHPO_4.3H_2O$. With 2 mols. NH_3/mol. P_2O_5, $(NH_4)_2HPO_4$ is formed which reacts with the $CaSO_4$ forming $CaHPO_4$; but a larger proportion should be avoided lest $Ca_3(PO_4)_2$ be formed. The ammoniated superphosphate, when freshly prepd., had a tendency to harden and lump which was found to be due to crystal growth of the sol. salts; however, when such hardened superphosphate was crushed in a roller mill a free-running powder was formed and the tendency to harden had disappeared. At present the superphosphate made is stored for some time and reground, or else redried to 2-3% H_2O, but tests are in progress to find suitable addns. to overcome the need for costly storage or redrying. Extensive tests of the ammoniated product in cotton-growing have proven its good quality. W. M. Sternberg

2

IVANOV, R.N., Cand Chem Sci --(diss) "Study of the process of the of superphosphate ammonization from Karatay phosphorites." Tashkent, 1959. 20 pp with ills. (Acad of Sci UzSSR. Inst of Chemistry), 200 copies (KL,30-59, 118)

IVANOV, R.N.

Conference of the workers of chemical and cement industries of Uzbekistan. Zav.lab. 26 no.7:906 '60. (MIRA 13:7)

1. Glavnyy spetsilist Gosudarstvennogo naucho-tekhnicheskogo komiteta Soveta ministrov Uzbekskoy SSR.
(Uzbekistan--Chemical industries)

IVANOV, R.N., kand.khim.nauk (Tashkent)

Ammonium-enriched superphosphate. Priroda 52 no.4:62-63 '63.
(MIRA 16:4)

(Uzbekistan--Phosphates)
(Uzbekistan--Ammonia as fertilizer)

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

CA

IVANOV, R.-N.

2

The damping of energy in films of surface-active substances. R. N. Ivanov. *Bull. acad. sci. U. R. S. S., Sér. géograph. géophys.* 1938, No. 1, 29-41; *Khim. Referat. Zhur.* 2, No. 2, 18-19(1939).—In films of soap soln. stretched between 2 wire rings, the equil. force (composed of the force of elasticity φ and the force of resistance f_0) depends on the mech. properties of the film (ν, elasticity, etc.). The force of resistance is supposedly proportional to the velocity of the displacement of the ring $y/_0 = \alpha y$. In this equation the value of the "damping const." α detn. the damping properties of the given film. In order to verify these conclusions an app. was constructed by means of which the value of the power w_0 of a unit of the surface film during a complete cycle of vibrations can be measured. During slow and reversible vibrations w_0 is the work done against the force of resistance only, i. e., $w_0 = f_0 \varphi$. Thus the previous supposition that $f_0 = \alpha \varphi$ is verified. The const. α_0 was measured for a no. of soaps and oils. Numerically in all cases it was close to the "damping const." α. The expts. also showed a large effect of the specific chem. properties of the films on their damping properties. Thus, α for the investigated substances varies from several hundreds (for oils, K laurate) to 0.37 (for K palmitate).

W. R. Henn

COMMON ELEMENTS

MATERIALS INDEX

CURRENT VARIABLES INDEX

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Investigation of the hydrostatic method of determining salinity. B. I. Ivanov. *Trudy Morskogo Gidrofiz. Inst., Akad. Nauk S.S.S.R., Sbornik Statei* 5, 3-14(1950).—An improved modification of Shpilevskii's app. for hydrostatic detn. of salinity is described. The improvement makes it possible to reduce errors and reach the highest possible accuracy. Various formulas are given for calcg. the effects of the various manipulations involved in the method upon the final result and introducing the necessary corrections. The proper handling of the app. is described. (I. S., *Physics of the Sea*, Akad. of Sci. Moscow—Leningrad, 1941.

SOV/124-58-7-7815

Translation from. Referativnyy zhurnal, Mekhanika, 1958, Nr 7, p 72 (USSR)

AUTHOR: Ivanov, R.N.

TITLE: An Electrically Measuring Sea Current Meter (Elektrometricheskaya morskaya vertushka)

PERIODICAL: Tr. Mosk. gidrofiz. in-ta AN SSSR, 1957, Vol 11, pp 73-83

ABSTRACT: Bibliographic entry

1. Ocean currents--Measurement 2. Electric meters--Applications

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SOV/124-58-11-12675

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 11, p 106 (USSR)

AUTHOR: Ivanov, R. N.

TITLE: Influence of the Shore on the Direction of a Wind-driven Surface Current (Vliyaniye berega na napravleniye vetrovogo poverkhnostnogo techeniya)

PERIODICAL: Tr. Morsk. gidrofiz. in-ta AN SSSR, 1957, Vol 11, pp 84-96

ABSTRACT: An explanation is provided of the mechanism of the influence of the shoreline on the direction of a wind-driven surface current. The reasoning is based on the author's own full-scale observations near the south shore of the Crimea near Katsiveli, full-scale observational data of Is. Islyamov obtained near the Libava lightship (Liēpāja lightship, LatvSSR; Transl. Note), and data by A. I. Mikhalevskiy for the Sredne-Zhemchuzhnyy lightship in the northern part of the Caspian Sea. Drift and gradient currents are considered as component parts of a general circulatory water current that arises under the influence of a wind and a shoreline. For the simplest case of a steady coastal wind-driven surface current, specifying a sufficiently rectilinear and extended shoreline and isobaths that run parallel to the shoreline, the

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APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000619120004-8

49-58-5-13/15

AUTHOR: Ivanov, R. N.

TITLE: The Energy Exchange Mechanism between Wind and Current. (O mekhanizme peredachi energii vetra techeniyu)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1958, Nr 5, pp 673-677 (USSR)

ABSTRACT: The reason for energy exchange between wind and water is usually considered to be friction. But when a body moves relative to a liquid or gas stream, dynamic pressure forces are present besides surface friction. These pressure forces depend on the shape of the body and its situation with respect to the current. This applies also to waves induced by air currents, even though a wave is not a body in the usual sense of the word. Thus the tangential stress f induced by the wind in the perturbed water surface is made up of the friction forces f_T and the horizontal component of the dynamic pressure, f_p i.e. $f = f_T + f_p$. The author next considers the question as to what influence these two factors have in the development of wind currents. Francis (Ref.1) suggested that the surface stress, induced by the

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wind, is due mainly to the friction of small, slow-moving ripples. The author mentions experiments he has carried out in the tank at the Black Sea division of the Maritime Institute of Hydrophysics (Morskoy gidrofizicheskiy Institut) of the Academy of Sciences USSR (Ref.2), to investigate the role of ripples in the transmission of energy. He used an apparatus which consisted of a frame made from two parallel tubes of sufficient strength fixed vertically into the tank. Wire was fixed between these two supports, perpendicular to the current, at various heights. A light aluminium plate 10 x 5 cm was fastened to each wire. In the experiments, the water was first calm and the plates hung vertically. Then a constant velocity wind was suddenly created and as the current extended through the liquid and its velocity increased, the plates deviated, one after the other, from the vertical (Fig.1). This deviation was photographed together with a special stop watch. From the data thus obtained, the interval between the creation of the wind and the deviation of any plate from the vertical through a small, but measurable, angle could be calculated. Fig.2 shows the results of one experiment. The abscissa gives the time interval, τ , for a deviation through an angle

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The Energy Exchange Mechanism between Wind and Current.

of 5^o (corresponding to a velocity of flow of 1-2 cm/sec). The ordinate gives the depth, z , of the plate from the surface. As can be seen, the disturbance is, of course, first induced in the upper layers and then transmitted downwards - the thickness of the layer concerned depending linearly on the time. The straight lines (z, τ) indicate, by their intersection with the τ axis, the moment that a surface current appears. It should be noted that this always coincides with the moment of appearance of ripples. We will see that before the appearance of ripples a current is formed, depending for its creation on the force f_T (Ref.3), but, at the moment that the ripples appear, this current possesses too small a supply of kinetic energy to be detected by the above apparatus. This fact - that current cannot be observed before the appearance of ripples - permits the assumption that f_p predominates over f_T .
The author now considers the force, f_p , in more detail.
Taking a band on the wave surface of unit width and length

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The Energy Exchange Mechanism between Wind and Current.

equal to the wavelength λ, it is required to calculate the horizontal component, $f_p \lambda$, of the wind pressure acting on the surface. p" and p' denote the wind pressure per unit surface on the windward and leeward sides of the wave, respectively. p" and p can be considered as functions of y - the elevation of an element of the wave surface above its base level. For the windward slope, the wind pressure along a normal to the surface on an element ds at a point with ordinate y is p"ds. The horizontal projection of this is p"sin αds (α being the relevant angle). But sin αds = dy and hence the projection equals p"dy. The integral of this from 0 to h gives the horizontal component of force. In a similar way, one gets the pressure on the leeward side, and, hence, taking the algebraic sum, one obtains:

$$f_p = \frac{1}{\lambda} \int_0^h (p'' - p')dy \qquad (1)$$

Following V. V. Shuleykin (Ref.2), the author puts:

$$p'' - p' = \delta_a (V - c_1)^2 \chi \qquad (2)$$

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where δ_a is the air density, V is the wind velocity, $c_1 = U_{z=0} + c$; $U_{z=0}$ is the velocity of the surface current averaged over a period, c is the phase velocity of the wave, χ is a dimensionless function of y/h and h is the wave height. The author considers χ as given (it can be calculated from Eq.(2). A change of variables is made in Eq.(1) by the substitution $\eta = y/h$ and Eq.(2) is substituted, giving Eq.(3). Hence, knowing the pressure distribution, χ can be calculated and then f_p . The disturbance is referred to as simple if waves of only one period are present, otherwise it is complex. Up to the moment pressure distributions have only been investigated for simple waves; so χ can be found as a function of the wave elements only for this case. V. V. Shuleykin's results (Ref.2) obtained in a wind tunnel with a stationary wave profile, are shown graphically in Fig.3 for two wave profiles of different inclination (Curve 1 corresponds to $h/\lambda = 0.06$ and curve II to $h/\lambda = 0.12$). It can be seen that χ is approximately proportional to h/λ . If this proportionality were strict then $\chi/h/\lambda$ would be constant for all h/λ ; as it is, a certain multiplying factor n is necessary. This factor can be made equal to one for one value of h/λ e.g. $h/\lambda = 0.06$ giving Eq.(4). Extending this over the average wave value, Eq.(5) results ($\bar{\chi}_{0.06} = 0.018$) . Fig.4 gives the graph of $\bar{\chi}$ against h/λ. In the construction of this curve three fixed points were taken:- $h/\lambda = 0$, $\bar{\chi} = 0$; $h/\lambda = 0.06$, $\bar{\chi} = 0.018$ and $h/\lambda = 0.12$, $\bar{\chi} = 0.042$. On extrapolation the greatest possible value for h/λ is found to be 0.143. From this graph and Eq.(5) 'n' can be calculated for different h/λ . For $h/\lambda = 0$, the magnitude of n can be obtained graphically as the limit as the derivative of the function χ and the argument of h/λ for $h/\lambda \to 0$. The graph of n and h/λ , thus found, is also given in Fig.4 - it is seen to be almost linear for all h/λ , giving Eq.(6) with a 5% error. (This is shown in Fig.4 by the dotted line). Eqs.(4) and (6) establish the dependence of χ on the wave elements. Substituting Eq.(4) in Eq.(3) gives Eq.(7). Numerical

The Energy Exchange Mechanism between Wind and Current.

integration of Eq.(7) can be done graphically from the corresponding curve in Fig.2, giving:

$$\int_0^1 \chi_{0.06} d\eta = 0.018$$

Substituting this Eq.(7) gives Eq.(8). Since the expression for f_p is usually written in the form Eq.(9), this, together with Eq.(8) gives Eq.(10). Fig.4 gives the dependence of k_p on h/λ . Multiplying both sides of Eq.(8) by λ a formula analogous to Newton's for fluid resistance is arrived at. Indeed, $f_p\lambda$ is total resistance force for one wave, h is the characteristic cross-sectional area of a wave (both $f_p\lambda$ and h are expressed in units of bands taken along the wave front), $V - c_1$ is the wind velocity relative to the moving waves. The resistance coefficient is represented by

c_* (Eq.11). k_p can be expressed in terms of c_* from Eqs.(10) and (11) - Eq.(12). In Newton's formula the resistance coefficient depends on the shape of the body, corresponding in our case to the slope of the wave. Also c_* and, hence, k_p depend in some manner on Reynold's number. The mechanism of energy transfer described above can also be applied to complex waves but with a different form of χ. Francis proposed a form of surface stress proportional to the first power of h/λ, whereas the author suggests the second power. This is because Francis assumed a constant resistance coefficient instead of one proportional to h/λ. It also seems too early to suggest that, in complex disturbances, small ripples play the most important part: more evidence is required. A value of h/λ $[(h/\lambda)_{eff}]$ can be calculated for which k_p has the same value as for the complex disturbances considered. Thus, in the sea $k_p = 0.003$ giving $(h/\lambda)_{eff} = 0.1$ - corresponding to small waves. It could be concluded from this that f_p is significantly

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The Energy Exchange Mechanism between Wind and Current.

larger than f_T . The development of wind currents can be imagined to be the following. If the water is completely calm before the wind appears, then a current will be started by surface friction after the wind arises. As soon as ripples appear, dynamic pressure on the surface also arises which produces much greater surface stress than the foregoing, so that it is this pressure which provides most of the energy exchange. More quantitative data is required to decide whether it is possible to neglect f_T in comparison with f_p . The author thanks V. V. Shuleykin for his assistance. There are 4 figures and 2 Soviet, 1 English reference.

ASSOCIATION: Akademiya nauk SSSR, Chernomorskoye otdeleniye Morskogo giurofizicheskogo instituta (Academy of Sciences USSR, Black Sea Division of the Maritime Institute of Hydrophysics)

SUBMITTED: March 15, 1957.

1. Ocean currents--Heat transfer 2. Wind--Physical properties

Card 9/9

IVANOV, R.N.

Relationship between the tangential wind stress over an agitated water surface and the velocity of wind. Trudy MGI 20:20-32 '60. (MIRA 13:10)

(Winds) (Ocean currents)

IVANOV, R.N.

Use of wave tanks in studying wind currents. Trudy MGI 23:94-121 '61. (MIRA 14:11)

(Hydrodynamics)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000619120004-8"

IVANOV, R.N.

Effect of waves on rise and flow phenomena at the seashore. Izv. AN SSSR. Ser. geofiz. no.7:955-964 Jl '62. (MIRA 15:7)

1. AN SSSR, Chernomorskoye otdeleniye morskogo gidrofizicheskogo instituta.

(Waves) (Ocean currents)

IVANOV, R.N.

Determining the velocity of near-bottom currents by a stationary recorder. Trudy Mor. gidrofiz. inst. AN USSR 30:59-69 '64. (MIRA 17:11)

L 8981-66 EWT(1)/FCC GW

ACC NR: AP5028359 44,55 UR/0362/65/001/011/1196/1204 26 17 B

AUTHOR: Ivanov, R. N.; Kaminskiy, S. T. 44,55

ORG: Black Sea Section, Marine Hydrophysical Institute (Chernomorskoye otdeleniye, Morskoy gidrofizicheskiy institut) 44,55

TITLE: The role of Stokes flow in Leningrad floods 12,44,55

SOURCE: AN SSSR. Izvestiya. Fizika atmosfery i okeana, v. 1, no. 11, 1965, 1196-1204

TOPIC TAGS: ocean dynamics, weather prediction, ocean current

ABSTRACT: The article attempts to calculate the profile of the surface waters in the Baltic Sea and the Gulf of Finland with drift and Stokes flow of stable surges for different wind velocities. The reasons for the catastrophic floods produced by the effect of storm winds have not yet been satisfactorily explained. The theory of drifts and flow gradients can not always explain the observed differences in level. The article starts with a mathematical analysis of the surface profiles in the Baltic Sea and the Gulf of Finland, based on existing literature data on the slopes of the surface of the sea for these latitudes. It then proceeds to an analysis of the complex surges produced at Leningrad itself. It is concluded that the rise in water

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ACC NR: AP5028359

levels in Leningrad under the influence of storm surges is produced mainly by the effect of drift and Stokes flows, but also sometimes by the effect of a long wave moving into the Gulf of Finland from the Baltic Sea. A rise in level produced by the effect of Stokes flow sets in relatively rapidly and, which is important to note, particularly strongly with high wind velocities over the Gulf of Finland. The effect of Stokes flow must certainly be taken into account in calculating the rise in level at Leningrad during floods. "In conclusion, we express our thanks to V.V. Shuleykin for his valuable observations and for his unchanging interest in the work, and also to N.A. Labzovskiy and N.O. Solntseva who kindly furnished certain material on the sea level at Leningrad for this work." Orig. art. has: 8 formulas and 6 figures.

SUB CODE: ES/ SUBM DATE: 16Apr65/ ORIG REF: 011/

OTH REF: 000

Card 2/2

IVANOV, R.N.

Development of wind currents. Trudy Mor. gidrofiz. inst. AN URSR 31:69-74 '64 (MIRA 18:2)

IVANOV, R.N.

Sea level rises due to waves and drift. Izv. AN SSSR. Fiz. atm. i okeana 1 no.1:94-108 Ja '65. (MIRA 18:5)

1. Chernomorskoye otdeleniye Morskogo gidrofizicheskogo instituta AN UkrSSR.

BASTOV, Viktor Fedorovich; IVANOV, Rodion Prokof'yevich; IPPOLITOV, Anatoliy Georgiyevich; MAREM'YANICHEV, S.N.; MOSOLOV, K.V.; IONOV, V.N., red.

[Teaching of the fundamentals of production mechanization and automation] Prepodavanie osnov mekhanizatsii i avtomatizatsii proizvodstva. Moskva, Vysshaia shkola, 1965. 157 p. (MIRA 18:7)

MOSOLOV, K.V.; BASTOV, V.F.; IVANOV, R.P.; IPPOLITOV, A.G.; MAREM'YANICHEV, S.N.; DUMCHENKO, N.I., kand. tekhn. nauk, retsenzent; ZAZERSKIY, Ye.I., inzh., retsenzent; BARSKIY, M.E., kand. tekhn. nauk, red.

[Fundamentals of the mechanization and automation of production processes] Osnovy mekhanizatsii i avtomatizatsii proizvodstva. Moskva, Mashinostroenie, 1964. 198 p. (MIRA 18:1)

DROBIZHIN, Vladimir Zinov'yevich; IVANOV, R.S., red.

[The Soviet working class in the period of the socialist reconstruction of the national economy] Sovetskii rabochii klass v period sotsialisticheskoi rekonstruktsii narodnogo khoziaistva; lektsiia, prochitannaia v Vysshei partiinoi shkole pri TsKPSS. Moskva, Izd-vo VPSh i AON pri TsK KPSS, 1961. 61 p. (MIRA 14:12)

(Labor and laboring classes)

IVANOV, R. S.

Hypertension

Curves of arterial pressure in the diagnosis of stages of hypertension. Klin. med 30 no. 7, 1952.

9. Monthly List of Russian Accessions, Library of Congress, December 1953. Unclassified.

IVANOV, R.S.

Arterial hypertension in pregnancy. Akush. i gin. no.5:30-34 S-O '54. (MIRA 7:12)

1. Iz filiala gospital'noy terapevticheskoy kliniki I Leningradskogo meditsinskogo instituta imeni akad. I.P.Pavlova i is otdeleniya fiziologii i patologii beremennosti Instituta akusherstva i ginekologii (dir. prof. A.P.Nikolayev) Akademii meditsinskikh nauk SSSR.
(PREGNANCY, in various diseases,
hypertension)
(HYPERTENSION, in pregnancy,)

USSR / General Problems of Pathology. Pathological Physiology of Infectious Processes. U-3

Abs Jour : Ref Zhur - Biol., No 17, 1958, No 80248

Author : ~~Ivanov, R. S.~~

Inst : Not given

Title : Role of Feverish Reaction in the Course of Pneumococcus and Staphylococcus Sepsis in Rabbits.

Orig Pub : V. sb.; Fiziol. mekhanizmy likhoradochn. reaktsii. L., Medgiz, 1957, 261-269.

Abstract : Rabbits with an experimentally-induced sepsis in which, before innoculation, an artificial increase of temperature was caused by means of the introductdn of an indifferent vaccine (B. mesentericus) or by means of overheating in a special chamber, showed a significantly greater capacity for survival in comparison with the controls. The animals in which a feverish reaction was depressed by administration of

Card 1/2

IVANOV, R.S., kand.med.nauk

Thermographic observations in rheumatic fever and focal infections. Vop. pat. krovi i krovoobr. no.5:45-57 '59. (MIRA 15:4)
(BODY TEMPERATURE) (INFECTION, FOCAL)
(RHEUMATIC FEVER)

IVANOV, R.S.

Clinical testing of chloracizine in coronary disease. Uch.zap. Inst.farm.i khimioter.AMN SSSR no.2:252-264 '60. (MIRA 15:10)

1. Kafedra fakul'tetskoy terapii Leningradskogo meditsinskogo pediatricheskogo instituta (zav. kafedroy d.m.n. prof. V.A. Val'dman).

(CORONARY HEART DISEASE)
(PHENOTHIAZINE)

IVANOV, R.S., kand.med.nauk

Thermoregulation disorders in rheuamtic fever and focal infections.
Vop.pat.krovi i krovoobr. no.6:113-121 '61. (MIRA 16:3)
(RHEUMATIC FEVER) (INFECTION, FOCAL) (BODY TEMPERATURE—REGULATION)

IVANOV, R.S., kand.med.nauk; MIKHAYLOV, V.V.

Infectious factor in lupus erythematosus disseminatus. Vop. pat.krovi i krovoobr. no.6:122-129 '61. (MIRA 16:3)
(LUPUS ERYTHEMATOSUS)

IVANOV, R.S., kand.med.nauk; KOVALENKO, N.N.

Diagnosis and clinical aspects of myocardial infarction. Vop. pat.krovi i krovoobr. no.6:130-137 '61. (MIRA 16:3)
(HEART—INFARCTION)

IVANOV, R.S.

Third Leningrad Scientific Conference on the problem of rheumatic fever and rheumatoid diseases. Vop. revm. 3 no.3:93-94 Jl-S'63 (MIRA 17:3)

IVANOV, R.S., dotsent

Protracted subfebrile states in chronic focal infections. Trudy LPMI 31 no.2:231-243 '63. (MIRA 17:10)

1. Iz kafedry fakul'tetskoy terapii Leningradskogo pediatricheskogo meditsinskogo instituta.

IVANOV, S.

"Influence of concentrated correlation of chromatographic ions in upsetting chromatography." In German. p. 41

DOKLADY. Sofiia, Bulgaria, Vol. 12, No. 1, January/February, 1959.

Monthly List of East European Accessions (EEAI), LC, Vol. 9, No. 2, February, 1960. Uncl.

IVANOV, S.; KHARITONOV, N.

In the drive for technical progress. Rech. transp. 20 no.1:10-12 Ja '61. (MIRA 14:2)

1. Nachal'nik Sluzhby sudovogo khozyaystva Belomorsko-Onezhskogo parokhodstva (for Ivanov). 2. Nachal'nik Planovo-ekonomicheskogo otdela Belomorsko-Onezhskogo parokhodstva (for Kharitonov).
(Inland water transportation)

IVANOV, ST.

Choice and Change of the Resestance Relative to Receiver Condensers.
RADIO (Radio) #9:31:Sep 54

IVANOV,S.

Measures controlling the heating of vacuum tubes. p. 43.

RADIO. Vol. 5, no. , 1956

Sofiia, Bulgaria

SOURCE: East European Accessions List (EEAL) Library of Congress, Vol. 6, No. 1, January 1957

IVANOV, S.

Valuable device for a radio mechanic. p. 55.

RADIO. Vol. 5, no. 1, 1956

Sofiia, Bulgaria

SOURCE: East European Accessions List (EEAL) Library of Congress, Vol. 6, No. 1, January 1957

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000619120004-8"

IVANOV, S.

IVANOV, S. Electric assembling of radio apparatus. p. 59.

Vol. 5, No. 3, 1956.
RADIO
TECHNOLOGY
Sofiia, Bulgaria

So: East European Accession, Vol. 6, No. 2, Feb. 1957

IVANOV, S.

Making needles for measuring instruments. p. 21.

RADIO. Vol. 5, no. 7, 1956

Sofiia, Bulgaria

SOURCE: East European Accessions List (EEAL) Library of Congress, Vol. 6, No. 1, January 1957

IVANOV, S.

Curiosities in radio technology. p.61.
(RADIO I TELEVIZIIA, Vol. 6, no. 1, 1957, Sofia, Bulgaria.)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. y, no. 12, December 1957 Uncl.

IVANOV, S.

Method for inscribing on the face of surfaces. p.19.
(RADIO I TELEVIZIIA, Vol. 6, no. 4, 1957, Sofia, Bulgaria.)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, no. 12, December 1957 Uncl.

IVANOV, S.

Mechanism of the selector switch. p. 39.
(RADIO I TELEVIZIIA, Vol. 6, no. 4, 1957, Sofia, Bulgaria.)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, no. 12, December 1957 Uncl.

IVANOV, S. (Riga)

Voices on the air. Radio no.10:12-13 0 '62. (MIRA 15:10)

(Radio operators)
(Amateur radio stations)

BUDANTSEV, Yuriy Yustovich; IVANOV, S., red.; NAZAROVA, A., tekhn. red.

[Electronic aides of a dispatcher] Elektronnye pomoshchniki dispetchera. Moskva, Izd-vo "Znanie," 1963. 31 p. (Novoe v zhizni, nauke, tekhnike. IV Seriia: Tekhnika, no.20) (MIRA 17:1)
(Industrial television) (Automation)

IVANOV, S.

With the permission of the director. Za bezop.dvizh. no.1:
5 Ja '60. (MIRA 13:5)

1. Obshchestvennyy inspektor 14-go otdeleniya Otdela regulirovaniya ulichnogo dvizheniya, Moskva.
(Traffic violations)

IVANOV, S.

New enterprises of the reinforced concrete industry. Stroi.mat. izdel. i konstr. 1 no.4:6-9 Ap'55. (MLRA 8:10)

1. Nachal'nik Glavzhelezobetona.
(Reinforced concrete)

KOSHEVOY, O.K.; MEYTIN, Ya.M.; BYALER, I.Ya. [deceased]; REZNICHENKO, V., inzh.; ~~IVANOV, S.,~~ inzh.; TUROVSKIY, B., red.; IOAKIMIS, A., tekhn.red.

[Plastics in building, architecture, and sculpture] Plasticheskie massy v stroitel'stve, arkhitekture i skul'pture. Kiev, Gos.izd-vo lit-ry po stroit. i arkhit.USSR, 1959. 195 p.
(Plastics) (MIRA 12:10)

IVANOV, S.

A machine drills a shaft. Nauka i zyhttia 12 no.1:15 Ja '63.
(MIRA 16:3)
(Donets Basin--Coal mines and mining)

KOMOLKIN, V., shofer 1-go klassa, obshchestvennyy avtoinspektor, udarnik kommunisticheskogo truda; IVANOV, S., obshchestvennyy avtoinspektor; UDALOV, N., shofer-lyubitel'

Readers suggest and seek advice. Za bezop.dvizh. 5 no.7:16 Jl '62. (MIRA 15:8)

1. 15-ye otdeleniye Otdela regulirovaniya ulichnogo dvizheniya Gosudarstvennoy avtomobil'noy inspektsii (for Ivanov).
(Traffic safety)

IVANOV, S.

Possibilities of reducing the cost of construction and assembly work. Muk.-elev. prom. 28 no.12:20-21 D '62. (MIRA 16:1)

1. Glavnyy bukhgalter tresta Spetselevatormel'montazh.
(Grain elevators) (Flour mills)

IVANOV, S.; TYAZHELKOV, A.

Promoters of technical development. NTO 4 no.12:12 D '62.
(MIRA 16:1)

1. Predsedatel' smotrovoy komissii Belomorsko-Onezhskogo basseynovogo pravleniya nauchno-tekhnicheskikh obshchestv (for Ivanov). 2. Chlen Belomorsko-Onezhskogo pravleniya nauchno-tekhnicheskikh obshchestv (for Tyazhelkov).
(Inland water transportation)

IVANOV, S.

"Cold Treatment," Nauka i Zhizn 19 (1952) No 12, pp 27/28.

B-84590, 26 Apr 55

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000619120004-8"

IVANOV, S., and others.

"Sanitary Culture on a Higher Level." p. 3,
(ZDRAVEN FRONT, No. 46, Nov. 1954, Sofiya, Bulgaria)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4
No. 5, May 1955, Uncl.

IVANOV, S.

The party's strong points. Sov. profsoiuzy 17 no.18:29-30 S '61. (MIRA 14:8)

1. Zaveduyushchiy kul'turno-bytovym otdelom Novgorodskogo oblsovprofa.
(Novgorod Province—Community centers)

IVANOV, S.

The "red corner" in a village. Sov. profsoiuzy 18 no.1:31 Ja '62. (MIRA 15:2)

1. Zaveduyushchiy kul'turno-bytovym otdelom Novgorodskogo oblprofsoveta.
(Novgorod Province--Community centers)

IVANOV, S.

Important regulation of the statutes of the CPSU. Mest. prom. i khud. promys. 3 no.1:17 Ja '62. (MIRA 15:2)

1. Sekretar' partbyuro Nauchno-issledovatel'skogo instituta khudozhestvennoy promyshlennosti, g. Moskva.
(Communist Party of the Soviet Union)
(Art industries)

IVANOV, S., polkovnik

Excellently know, take care of, and skillfully use materiel and weapons. Komm. Vooruzh. Sil. 46 no. 21:74-79 N '65
(MIRA 19:1)

S. IVANOV

Variations of the dielectric constants of phosphorescent sulfides under the influence of light. S. Ivanov. Annuaire Univ. Sofia, Fac. phys.-math., Livre 1, 41, 73-102(1944-1945)(French summary).—A method of photographic registration of elec. pulses was used to measure the dielec. const. (D) of phosphorescent sulfides of the type $(ZnS)_{[illegible]}$-$(CdS)_{[illegible]}$-Cu. For all sulfides used D starts changing immediately after illumination; the change is very fast at the beginning but slows down and attains a limiting value specific for each sulfide. On stopping the illumination D varies in the opposite direction, but the time required to reach the initial value is much longer; $(ZnS)_{[illegible]}$-$(CdS)_{[illegible]}$-Cu required the shortest time. D varies with the energy of the incident light, again attaining a limiting value. When the CdS content is increased the no. of resonance regions increases and the spectral region causing changes in D and phosphorescence widens; for sulfides contg. over 50% CdS changes in D were observed even in the infrared region. The following are the values of D for some of the sulfides detd. in this work: ZnS-Cu, 3.35 (powder) and 7.45 (solid); $(ZnS)_{[illegible]}$-$(CdS)_{[illegible]}$-Cu, 3.06 and 6.80; $(ZnS)_{[illegible]}$-$(CdS)_{[illegible]}$-Cu, 2.88 and 6.41; S, 1.81 and 4.02; glass, 2.63 and 5.85. O. Meguerian

2

eA

A method of registration of the electric beats for measurement of variations of the dielectric constant of phosphors. G. Nadjakov and A. Ivanov. (Univ. Sofia, Bulgaria). Proc. Intern. Congr. Pure and Applied Chem. (London) 11, 577-83(1947)(in English).—The method of elec. beats used to measure variations in capacity is modified to permit objective measurements. A sound frequency obtained by superimposing the vibrations from 2 high-frequency oscillators is in turn superimposed with the vibrations from a 3rd oscillator in a one-valved amplifier to produce the required sep. beats. The beats are registered on a moving strip of photographic paper. As little as $^1/_{50}$ of the capacity change corresponding to a single beat, when length of beat is 15-20 mm., can be measured with certainty. Small variations in the dielec. const. of a medium can be measured with the app. and certain conclusions regarding the changes that occur in phosphors can be drawn from the form of the curves, Δc vs. time. The capacity change for moist phosphors (ZnS_{Cu}—CdS_{Cu}—Cu) is greater than for dry phosphors. Mech. action like grinding or pressing decreases the effect of light on the dielec. const. of phosphors. The latter phenomenon parallels the decrease in phosphorescence due to the same cause.

F. N. Ward

1947

C-4 Gen. Techniques
& Lab. Apparatus
(Electrical)

B. Abs.

920. Recording of electric beats for measuring variations of dielectric constant. G. Nadjakov and R. Dyulgerov (C. R. Acad. Bulg. Sci., math. nat., 1948, [1], 1, 35—38).—Circuit details are described for the adaptation of the method of electric beats for measuring variations of dielectric const. (ϵ) to photographic recording. The smallest variations may be measured and their behaviour studied. The use of the apparatus to study the effect of light and humidity on ϵ is described (cf. A., 1950, I, 20).

H. R. CRUMPLER.

IVANOV, S.

" The Stalin State Polytechnic," p. 8.
(Bulgaria, No.2, Feb. 1953, Sofiya.)

SO: Monthly List of ~~Russian~~ East European Accessions, Vol.2, No.9 /Library of Congress, September 1953, Uncl.

GIUROV, At.; BONCHEV, L.; DOBREVA, Ek.; IVANOV, S.; ENCHEVA, M.; RUTKOVA, L.

Obtaining the zinc oxide monocrystals with ammonia as reducing agent. Godishnik mash elekt 12 no. 1:101-106 '62 [publ. '63].

FEDOTOV, Yakov Andreyevich, kand. tekhn. nauk; IVANOV, S., red.; NAZAROVA, A., tekhn. red.

[Towards microelectronics] Na puti k mikroelektronike. Moskva, Izd-vo "Znanie," 1963. 45 p. (Novoe v zhizni, nauke, tekhnike. IV Seriia: Tekhnika, no.7) (MIRA 16:4)
(Miniature electronic equipment)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000619120004-8"

GRIGOROV, G.; IVANOV, S.

Sensitive thermo-conduction gauge with measuring thermistor. Doklady BAN 16 no. 8: 797-800 '63.

1. Submitted by Corresponding Member E. Djakov [Dzhakov, E.].

IVANOV, SAZDO

(Physics; university lectures. 2d ed. illus., bibl., diagrs., graphs, index)

Monthly list of East European Accessions (EEAI), LC, Vol. 8, No. 6, Jun 59, Unclas

IVANOV, S.

Method for determining the components of the complex dielectric permeability. Sazdo Ivanov (École Polytechnique Sofia, Bulgaria). J. Phys. radium 19, No. 7, Suppl. 98A-101A(1958).—The method uses phase difference to sep., measure, and study the variations in dielec. permeability and dielec. loss with a precision of 1-2%. The method has been used with powd. polycryst. phosphors, and with CdS single crystals, when illuminated by a Hg lamp. The increase in dielec. loss is greater than that for the dielec. permeability in the case of CdS. For mixed phosphors, such as ZnS-CdS activated with Cu, the converse is found, and the increase in dielec. permeability and dielec. loss follows an exponential law as a function of the exciting energy. With CdS the increase is almost linear. H. Rosenwasser

3

Cq

VARBANOVA, S.[Vurbanova, S.]; IVANOV, S.

Inhibitory effect of polymethylene-bis-lepidinic dirtromides on serum cholinesterase activity. Doklady BAN 17 no.7:665-667 '64.

1. Submitted by Corresponding Member P. Nikolcv.

GRIGOROV, G.; IVANOV, S.

Sensitive thermoelectric vacuum gauge with a thermistor. Prib. i tekh. eksp. 9 no.3:129-131 My-Je '64 (MIRA 18:1)

1. Fizicheskiy fakul'tet Universiteta, Sofiya, Bolgariya.

L 32213-66 EWP(t)/ETI IJP(c) JD

ACC NR: AP6020810 SOURCE CODE: BU/0011/65/018/006/0525/0528

AUTHOR: Ivanov, S.; Djoglev, D.; Stefanov, D.; Danchev, I.; Petrov, P.; Janachkova, I.; Bizheva, L.

ORG: Institute of Physics, BAN

49
B

TITLE: Some properties of thermistors made of three-compound oxide systems

SOURCE: Bulgarska akademiya na naukite. Doklady, v. 18, no. 6, 1965, 525-528

TOPIC TAGS: thermistor, semiconductor research, admixture, x-ray analysis

ABSTRACT: Thermistors are usually made of oxide mixtures (see, e.g., N. P. Potapov, Tr. Odessk. gidro-meteorol. i-ta, 37, 1956, No. 8; M. Ya. Kushnerev, V. P. Linde, S. Z. Roginskiy, FTT, III, 1961, No. 2, 384). The present paper describes the production of three-component MnO_2-Ni_2O_3-CO_2-O_3 and MnO_2-Ni_2-O_3-ZnO systems whose properties may be altered by small admixture activation. In addition to the Volt-Ampere and temperature characteristics of the system, the authors present also comprehensive results of X-ray structural analysis of the various semiconductors produced and the distribution of metallic admixtures within the spinel structures. This paper was presented by Academician G. Nadjakov on 23 February 1965. Orig. art. has: 2 figures and 2 tables. [Orig. art. in German] [JPRS]

SUB CODE: 09, 07/ SUBM DATE: 23Feb65 / ORIG REF: 004/ SOV REF: 003

Card 1/1

2C

L 23315-66
ACC NR: AT6004210 SOURCE CODE: BU/2503/65/013/001/0185/0192

AUTHOR: Stefanov, D.; Danchev, Iv.; Yanachkova, Iv.; Petrov, P.; Ivanov, S.; Dzhogiev, D.; Bizheva, L.

ORG: none

TITLE: X-Ray structural studies of thermistors obtained from the three-component systems MnO_2-Ni_2O_3-Co_2O_3 and MnO_2-Ni_2O_3-ZnO

SOURCE: Bulgarska akademiya na naukite. Fizicheski institut. Izvestiya na Fizicheskiya institut s ANEB, v. 13, no. 1, 1965, 185-192

TOPIC TAGS: thermistor, spinel, mineral, x ray investigation

ABSTRACT: Thermistors baked at a temperature of 1150C, which have been studied in detail in earlier papers are the object of detailed X-ray structural investigations. The X-ray structural data obtained have shown that after baking new chemical compounds are formed of the type of spinels. According to the chemical composition of the mixtures studied, different spinels are formed. The cubic spinel

2

Card 1/2

L 23315-66
ACC NR: AT6004210

$NiMn_2O_4$ has been established for the mixture I and for the two oxide systems. The intermediary mixtures, II to V included, are represented by cubic spinels of a variable cation composition. Mixture VII is represented by the tetragonal spinels $CoMn_2O_4$ and $ZnMnO_2$. On the basis of data from the literature on the position of the metal cations in $NiMn_2O_4$ and $CoMnO_4$ an attempt has been made to elucidate the distribution of the cations in the spinel structures of thermistors studied by the authors. Orig. art. has: 3 figures and 2 tables. [Based on author's abstract]

SUB CODE: 09, 07/SUBM DATE: none ORIG REF: 002/ SOV REF: 004/

Card 2/2 vvR

L 23316-66

ACC NR: AT6004211 SOURCE CODE: BU/2503/65/013/001/0193/0200

AUTHOR: Yanachkova, Iv.; Danchev, Iv.; Petrov, P., Stefanov, D.; Ivanov, S.; Dzhoglev, D.; Bizheva, L.

ORG: none

TITLE: Influence of impurities on the semiconductor properties of thermistors composed of MnO_2-Co_2O_3-Ni_2O_3

SOURCE: Bulgarska akademiya na naukite. Fizicheski institut. Izvestiya na Fizicheskiya institut s ANEB, v. 13, no. 1, 1965, 193-200

TOPIC TAGS: thermistor, electric property, resistor, semiconductivity

ABSTRACT: Heat-sensitive resistors with a negative temperature coefficient are obtained from metal oxides in a ratio of MnO_2-60%, Co_2O_3-29.7% and Ni_2O_3-1.3%. The oxide mixture is doped with solutions of Li_2CO_3, $Cu(NO_3)_2$, CsCl, $CeCl_3$, $Ce(SO_4)_2$ compounds of concentrations of the order of 10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}, 10^{-2}, 10^{-1}, 10^{0} wt % of the metal activator. The obtained mixture is wet-milled

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L 23316-66
ACC NR: AT6004211

dried at 80C and then dry-milled again. The electrical properties of the thermistors obtained by pressing, sintering at 1150C and again at 120C for 200 hours are investigated. By increasing the concentration of the activator the resistance R_{20} of the samples activated by Li^{+} and Cu^{2+} decrease from the order of 1 to 3.5, while the R_{20} of those activated with $Cs1+$, Ce^{3+} and Ce^{4+} showed no significant changes. The thermistors have a temperature coefficient α_{20}. The X-ray investigation indicated a new phase in the form of tetragonal spinel $CoMn_2O_4$. No structural changes were produced by small amounts of activators. Orig. art. has: 2 figures and 4 tables. [Based on author's abstract]

SUB CODE: 09/ SUBM DATE: none ORIG REF: 002/ SOV REF: 001/
OTH REF : 004/

Card 2/2 LC

SUKHOVA, G.V.; IVANOV, S.A.; ODAYSKAYA, Ye.D.

Equipment for washing work clothes and cleaning dust off them.
Adm.-byt. komb. ugol'. shakht. no.4:37-42 '61. (MIRA 15:8)

1. Akademiya kommunal'nogo khozyaystva im. K.D.Pamfilova.
(Work clothes--Cleaning) (Dust--Removal)

21.1000,24.7600

77237
SOV/89-8-2-2/30

AUTHORS: Kramerov, A. Ya., Fridman, Ya. B., Ivanov, S. A.

TITLE: Thermal Stresses in Reactor Structures

PERIODICAL: Atomnaya energiya, 1960, Vol 8, Nr 2, pp 101-111 (USSR)

ABSTRACT: Introduction. Specific operating conditions of nuclear reactors stimulated many studies of thermal stresses and their causes, in particular, studies of: (a) intensive neutron and γ-radiations lowering ductility at low temperatures; (b) internal sources of radiative heat-generation; (c) high heat flows (10^6 kcal/$m^2\cdot$h) and heat-generation densities (10^9 kcal/$m^3\cdot$h) which cause large temperature gradients (approximately 100° C/mm); (d) applications of new, little-known materials and combinations of materials with different thermal expansion coefficients; (e) thermal shocks in structures (like those following sudden shutdowns of reactors in case of damage); and (f) use of new complex structures not having analogs in conventional engineering, nor

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being tested during continuous operation. Estimate of the Magnitude of Thermal Stresses. The authors first review the known facts that in the case of very high thermal stresses the body or parts of it become ductile, causing thermoplastic stresses which depend also on the "prehistory" of the body. Ther thermoplastic stresses can be computed by known approximate methods. In the elastic region stresses determined at any moment by the temperature field, and the temperature fields themselves, can be obtained using known system of equations for thermal conductivity and theory of elasticity. For the case of bodies with cylindrical symmetry, often encountered in reactors, there exist known equations valid in the case of no outside field, for the azimuthal, radial, and axial normal thermoelastic stresses of the first order σ_θ, σ_r, and σ_z.

$$\sigma_\theta = \frac{E}{1-\nu}\left(\frac{1}{r^2}\frac{r^2+a^2}{b^2-a^2}\int_a^b \alpha\Delta T(r)\,r\,dr + \right.$$

$$\left. + \frac{1}{r^2}\int_a^r \alpha\Delta T(r)\,dr - \alpha\Delta T(r)\right); \qquad (3)$$

$$\sigma_r = \frac{E}{1-\nu}\left(\frac{1}{r^2}\frac{r^2-a^2}{b^2-a^2}\int_a^b \alpha\Delta T(r)\,dr - \right.$$

$$\left. - \frac{1}{r^2}\int_a^r \alpha\Delta T(r)\,r\,dr\right) \qquad (4)$$

and

$$\sigma_z = \sigma_\theta + \sigma_r. \qquad (5)$$

where E is Young's modulus (kg/cm^2); ν is Poisson coefficient; $\Delta T = T_r - T_{or}$ is the change in temperature with respect to the original temperature (T_{or})

of the unstressed state; a, b are the inner and outer radii of the tubing; α is the coefficient of thermal linear expansion. The authors discuss some special cases, and derive the known equation

$$\sigma = \frac{E}{1 - c\nu} (\overline{\alpha \Delta T} - \alpha \Delta T). \qquad A$$

where $\overline{\alpha \Delta T}$ is the value of the mean free thermal stretching, and c can take the values of 0, 1, and 2 for the uniaxial, biaxial, and volume stresses respectively. This equation enables one to find the largest stress in a cylindrical bar, thick-walled tube, in a plate with fixed ends, and a symmetrical temperature distribution in some other cases when principal deformations in every point are equal to one another, or some of them are equal to zero (linear and plane stress states), and also if they are constant over any main surface. The authors note that little was done to develop methods for evaluating thermal stresses of the second order. Thermal stresses of the first order and temperature distributions may be represented as a sum of the particular solution of the homogeneous equation (without internal sources of heat and actual boundary conditions--index ΔT) and the solution of the heat transfer equation with internal heat sources and a zero boundary condition (index q). This is a consequence of the linearity of the heat transfer equation. Each of these solutions can in turn be written as a product of three terms, expressing respectively the influence of the physical properties, density of heat generation, and the size (or ΔT_0) and shape of the bodies. The authors obtained

$$\sigma = \sigma_q + \sigma_{\Delta T} = \left[\frac{\alpha E}{1-\nu}\frac{1}{\lambda}\right]\left[\frac{q r_0^2}{4}\right]\Psi_{\sigma_q} + \left[\frac{\alpha E}{1-\nu}\right]\left[\frac{\Delta T b}{2}\right]\Psi_{\sigma_{\Delta T}}. \qquad 8$$

by using Eq. (2)

$$\Delta T = \frac{q_F \frac{1}{2} r_0}{\lambda} = \frac{1}{\lambda} \frac{Q}{F_q} \frac{V}{F_q} = \frac{q}{4\lambda} r_0^2, \qquad (2)$$

for the temperature difference across the cross section of a more of less plastic body, in the presence of internal heat sources. Here q is the density of heat generation rate ($kcal/m^3 \cdot h$); $1/2\ r_o = 1/2\ \frac{2V}{F_q}$ is the quantity proportional to the mean distance of travel of heat in the body; V is the volume of the body (m^3); $q_F = \frac{Q}{F_q}$ is the heat flow ($kcal/m^2 \cdot h$); Q is the total heat transfer rate (kcal/h); F is the surface of the heat exchange; and Ψ is the form factor, equal to the ratio of stresses (or temperature drops) on the

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body of a given shape to those in a cylinder (all other conditions being equal). If we neglect neutron energy absorption, we have to take into account only the average absorption of γ-rays, which is proportional to the specific gravity for elements in the middle of the Atomic Table. We do this by modifying the first factor (expressing the influence of physical factors) in Eq. B into

$$\frac{\alpha E}{1-\nu}\frac{\gamma}{\lambda}. \qquad C$$

Introducing finally the ratio σ / σ_D, the term accounting for physical properties becomes

$$\frac{\alpha E}{1-\nu}\frac{1}{\lambda\sigma_T}. \qquad D$$

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adjusted for the possibility that the body becomes plastic. It is difficult to avoid the transition to the domain of irreversible deformation when working with materials of high α and low λ and σ_D. Uranium and stainless steel in this respect are poor. In spite of their low σ_B and σ_T value, thorium, graphite, and, in a smaller degree, zirconium and aluminum are less liable to produce permanent deformations. (Abstracter's Note: λ, $\sigma_{D(uctile)}$ and σ_B were never defined in this article.) The authors point out that even without touching the problems of cost, radiation stability, and corrosion stability of materials, their comparison concerning the thermal stress stability represents an extremely complex and conditional problem. Appropriate complex coefficients should contain reliability coefficients which are still vague for many ductile materials subjected to thermal fatigues. The influence of the σ_D quantity is not well defined since its increase sometimes turns out to be harmful (because of a slower relief from the thermal stresses of the plasic deformation), but can also have useful influences, such as a reduction of accumulation of plastic deformations. In addition, many properties depend on the preparation and structure of the material. Comparison of heat-generating elements of various shapes. The authors require that for comparison purposes all the elements have the same volume per unit of the heat-emitting surface. They present an equation for maximum temperature drops and macrotemperature elastic stresses of the first kind for four basic cross sections of heat-producing elements (not taking into account heat production). The temperature drop $\frac{qr_o^2}{4\lambda}$ along r_o is denoted by ΔT_o, and the maximum thermoelastic stresses in the cylinder $\frac{\alpha E}{1-\nu} \frac{\Delta T_o}{2}$ is denoted by σ_o. These equations were obtained after solving the equations for stationary heat transfer $(-\lambda \Delta T = q)$, assuming

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appropriate boundary conditions. The derivation of the most complicated third case is presented in the Appendix. In case 1 concerning a tube or cylinder cooled from the outside

$$\Delta T_{max} = \Delta T_0 \Psi^{(1)}_{\Delta T_q}, \ (\sigma_\theta)_{r=b} = \sigma_0 \Psi^{(1)}_{\sigma_q}.$$

Case 2 represents represents a tube cooled from the inside,

$$\Delta T_{max} = \Delta T_0 \Psi^{(2)}_{\Delta T_q}; \ (\sigma_\theta)_{r=a} = \sigma_0 \Psi^{(2)}_{\sigma_q}.$$

In the case 3 the tube is cooled both from the inside and outside

$$\Delta T_{max} = \Delta T_0 \frac{1-\tilde{\varrho}^2(1-\ln \tilde{\varrho}^2)}{(1-\varrho)^2}.$$

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